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REVIEWS

Grundzüge der Paläontologie. Von KARL A. VON ZITTEL. II. Abteilung. Vertebrata. Neubearbeitet von F. BROILI, E. KOKEN, M. SCHLOSSER. München und Berlin, 1911. Pp. 598.

Zittel's *Handbuch der Paläontologie*, the publication of which was completed nearly twenty years ago, marked the beginning of a new epoch in paleontology. And his compendium, or *Grundzüge*, the first edition of which was published in 1895, the English edition by Eastman in 1900-1902, has been of the greatest service to all students of the science. But the years that have elapsed since these editions appeared (and the English edition did not include the mammals) have greatly impaired their usefulness. The science of paleontology, and especially vertebrate paleontology, is progressing with such rapidity that even a few years leaves any text behind.

It is very doubtful whether other editors could have been found as competent for the present edition as Broili, Koken, and Schlosser. Additions and changes have been made with great conservatism, some will think with undue conservatism; but, in the opinion of the reviewer, conservatism here is a commendable fault, if fault it be. It will be time enough to accept the many new orders and suborders of vertebrates, the many changes in classification, which have been proposed in recent years when they shall have stood a longer test. In the past history of science the majority of such innovations are ultimately rejected.

Of the fishes, treated by Koken, six subclasses are accepted: the Placodermi, or Agnatha, Elasmobranchii, Holocephali, Dipnoi, Arthrodira, and Teleostomi. As regards the Arthrodira the relations of which have been the subject of no little discussion in recent years, Koken rejects the evidence of Placodermi affinities and accepts those of the Dipnoi. "Die *Dipnoer* . . . sind den *Arthrodira* näher verwandt . . . mit den *Placodermen* nicht so nah wie früher angenommen."

The revision of the Amphibia and Reptilia has been well done by Broili; one misses little that should be included in the work. The many new discoveries among extinct amphibia have been intercalated without change in the classification, notwithstanding the new schemes, especially those of Jaekel, which have been proposed—and which yet

await justification. Doubtless changes will be required at no very distant time, for the Lepospondyli, at least, as stated, are in a very unsatisfactory condition; but the present urgent need here as elsewhere among the ancient vertebrates is more facts, not more new theories.

Among the Reptilia, also treated by Broili, only one new order is admitted, the Parasuchia, concerning which there is now a unanimity of opinion; nor have additional suborders been admitted, perhaps unwisely, save the Chelonidea among the turtles. The union of the cotylosaur reptiles in the same order with the theriodonts seems ultra-conservative, and yet the reviewer must admit that there seems to be no broad line of demarcation in the series between the two extremes. The writer does not agree with Broili in his disposition of *Lysorophus* among the lizards, nor of *Placodus* and *Mesosaurus* among the Sauropterygia.

The treatment of the birds, by Schlosser, is essentially that of the Eastman edition, with minor changes.

Especially welcome is the part devoted to the mammals, including nearly half of the work. Dr. Schlosser's reputation as a mammalogist is deservedly high, and his views will have much authoritative value. The recent works by Osborn and Gregory are of the greatest value, but nothing can take the place of such a compendium as the present one, with its precise definitions and systematic arrangement. One is interested to observe that, in place of the twenty-eight orders of Osborn, Schlosser follows the usual classification of the placental mammals into the Insectivora, Rodentia, Chiroptera, Carnivora, Cetacea, Edentata, Ungulata, and Primates, while the Sirenia, Proboscidea, and Hyracoidea are grouped with the Embrithopoda under the order Subungulata, of African origin; and the chief groups of South American origin, the Typotheria, Toxodontia, Entelonychia, Astrapotheroidea, and Pyrotheria are included under the order Notungulata. He classes the Monotremata and Marsupialia under the Eplacentalia. The Multituberculata, including even the disputed *Tritylodon*, are classed as marsupials, against which Dr. Broom and the present writer have protested. One can scarcely conceive of the possibility of the immediate evolution of reptiles into marsupial mammals in face of the oviparous mammals existing today. Notwithstanding the evidences afforded by *Ptilodus* the writer, as a herpetologist, firmly believes that the early multituberculate mammals were oviparous, with all the essentially primitive characters possessed by the living monotremes in the pectoral girdle, genital apparatus, etc.

Many new figures have been added to the work, but some have been retained which should have been rejected. Some minor errors are noticeable. Dr. Dall will be surprised to see that he is cited on page 177 as a writer on extinct frogs! The edition as a whole is very welcome to every student of extinct vertebrates; we only regret that the English edition might not also be brought up to date and the mammals included.

S. W. W.

“Beiträge zur Kenntnis der Oligozänen Landsäugetiere aus dem Fayum (Aegypten).” By MAX SCHLOSSER. *Beiträge zur Paläontologie und Geologie*, XXIV (1911), pp. 51-167; Pls. IX-XVI.

Perhaps no discoveries of extinct animals in recent years have excited more general interest than those of the Oligocene of the Fayum in Africa, as first made known by Beadnell and Andrews and later by Osborn. The present contribution by Schlosser, based upon extensive collections made for the Stuttgart Museum, adds very materially to this interest. In it he describes and figures new creodonts and rodents, an insectivore, a bat, and three new genera of primates of especial interest. And our knowledge of the Hyracoidea is also materially increased by the addition of much new material—“so dass die Andrewsche Monographie auch für diese Gruppe vollkommen veraltet erscheint.”

Most interesting of his discoveries is the new simiid *Propliopithecus*; and but little less so are his new genera *Parapithecus* and *Moeropithecus*, the former representing a new family of anthropoids. *Propliopithecus* he believes has a direct genetic relationship with *Homo*: “Aber auch für die Ableitung der Gattung *Homo* und wohl auch der Gattung *Pithecanthropus* (wenn nicht mit *Homo* identisch) von den oligozänen Genus *Propliopithecus* besteht kein prinzipielles Hindernis, denn in den oben berücksichtigten Merkmalen hat die Gattung *Homo* mit *Propliopithecus* sogar entschiedene grössere Ähnlichkeit als alle lebenden Simiiden-Gattungen.” And he thinks that the recognition of this African antecedent of *Homo* is to be welcomed as doing away with the necessity of resorting to eoliths as proof of the existence of ancient Man. “If now *Propliopithecus* is the direct ancestor of Man the impossibility of his making eoliths is evident, since *Propliopithecus* had probably only the body dimensions of a human infant, and that so small a creature could have used stones of the size of the usual eoliths no one will seriously affirm.” In the evolution of the Hominidae, aside from the gradual increase in body size, there has been a shortening of the premolars, a